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Page 1 of 17

Date: May 14, 2008

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Art Unit:
2182

From:
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Intel Corporation

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Subject:
10/762,037

Docket Number:
P18575

Filing Date:
January 20, 2004

Inventor:
Zohar Bogin

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TRANSMITTAL FORM <i>(to be used for all correspondence after initial filing)</i>	Application Number	10/762,037	RECEIVED CENTRAL FAX CENTER MAY 14 2008
	Filing Date	January 20, 2004	
	First Named Inventor	Zohar Bogin	
	Art Unit	2182	
	Examiner Name	Sun, Scott C.	
Total Number of Pages in This Submission	17	Attorney Docket Number	P18575

ENCLOSURES (Check all that apply)		
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Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).**FEE TRANSMITTAL**
For FY 2005**Complete if Known**

Application Number	10/762,037
Filing Date	January 20, 2004
First Named Inventor	Zohar Bogin
Examiner Name	Sun, Scott C.
Art Unit	2182
Attorney Docket No.	P18575

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CENTRAL FAX CENTER**MAY 14 2008**☐ Applicant claims small entity status. See 37 CFR 1.27**TOTAL AMOUNT OF PAYMENT** (\$)**METHOD OF PAYMENT** (check all that apply)☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____☒ Deposit Account Deposit Account Number: 50-0221 Deposit Account Name: Intel Corporation

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FEE CALCULATION**1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES**Fee Description**

Each claim over 20 (including Reissues)

Fee (\$)

Small Entity Fee (\$)

50

25

Each independent claim over 3 (including Reissues)

200

100

Multiple dependent claims

360

180

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
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- 20 or HP = _____ x _____ = _____

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
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3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
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SUBMITTED BY

Signature	/Philip A. Pedigo/Reg. No. 52,107/	Registration No. 52,107 (Attorney/Agent)	Telephone 503-712-5560
Name (Print/Type)	Philip A. Pedigo	Date May 14, 2008	

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FEE TRANSMITTAL
For FY 2005**Complete if Known**

Application Number	10/762,037	RECEIVED CENTRAL FAX CENTER MAY 14 2008
Filing Date	January 20, 2004	
First Named Inventor	Zohar Bogin	
Examiner Name	Sun, Scott C.	
Art Unit	2182	
Attorney Docket No.	P18575	

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$)

METHOD OF PAYMENT (check all that apply)☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____☒ Deposit Account Deposit Account Number: 50-0221 Deposit Account Name: Intel Corporation

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☒ Charge fee(s) indicated below☐ Charge fee(s) indicated below, except for the filing fee☒ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17☒ Credit any overpayments

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100

Multiple dependent claims

360

180

Total Claims **Extra Claims** **Fee (\$)** **Fee Paid (\$)****Multiple Dependent Claims**

- 20 or HP = _____ x _____ = _____

Fee (\$) **Fee Paid (\$)**

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims **Extra Claims** **Fee (\$)** **Fee Paid (\$)**

- 3 or HP = _____ x _____ = _____

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Total Sheets **Extra Sheets** **Number of each additional 50 or fraction thereof** **Fee (\$)** **Fee Paid (\$)**

- 100 = _____ / 50 = _____ (round up to a whole number) x _____ = _____

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Fees Paid (\$)

Other (e.g., late filing surcharge): _____

SUBMITTED BY

Signature	/Philip A. Pedigo/Reg. No. 52,107/	Registration No. 52,107 (Attorney/Agent)	Telephone 503-712-5560
Name (Print/Type)	Philip A. Pedigo	Date	May 14, 2008

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Docket No.: P18575

Patent

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re the Patent Application of:

Zohar Bogin

Serial No.: 10/762,037

Filed: January 20, 2004

**For: A Method and An Apparatus to Manage
Memory Access Requests**

Art Unit: 2182

Examiner: Sun, Scott C.

Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313

APPEAL BRIEF UNDER 37 CFR § 41.37

Sir:

This Brief is filed in response to a Notice of Non-Compliant Appeal Brief mailed on March 3, 2008. Applicants (hereafter "Appellants") hereby submit this Brief in support of its appeal from a final decision by the Examiner, mailed July 24, 2007 in the above-captioned case. Appellants respectfully request consideration of this appeal by the Board of Patent Appeals and Interferences for allowance of the above-captioned patent application.

An oral hearing is not desired.

Docket No.: 42390P18575
Application No.: 10/762,037

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I. REAL PARTY IN INTEREST

The invention is assigned to Intel Corporation of 2200 Mission College Boulevard, Santa Clara, California 95052-8119.

II. RELATED APPEALS AND INTERFERENCES

To the best of Appellant's knowledge, there are no appeals or interferences that are related to, will directly affect, will be directly affected by, or have a bearing on the Board's decision in the present appeal.

III. STATUS OF THE CLAIMS

Claims 1 and 3-7 are currently pending in this application. Claims 2 and 9 have been cancelled. Claims 8 and 10-20 have been cancelled in an amendment filed with this response and the amendment has not been acted upon by the Examiner. Claims 21-29 have been withdrawn. No claims have been allowed. All pending claims were rejected in the final Office action mailed July 24, 2007 and are the subject of this appeal.

Claims 1, 3, and 13 stand rejected under 35 U.S.C. §102(e) as anticipated.

The remaining claims stand rejected as obvious, but these rejections rely on the anticipation rejection.

Claims 4, 8, 10, and 14-20 stand rejected under 35 U.S.C. §103(a) as obvious.

Claims 5, 6, 11, and 12 stand rejected under 35 U.S.C. §103(a) as obvious.

Claims 7 stands rejected under 35 U.S.C. §103(a) as obvious.

IV. STATUS OF AMENDMENTS

In response to the Final Office Action mailed on July 24, 2007, rejecting claims 1, 3-8, and 10-20, Appellants timely filed a Notice of Appeal on October 15, 2007. In addition, the Appellant has filed an amendment to cancel claims 8 and 10-20. The Examiner has not acted upon the amendment to cancel claims 8 and 10-20.

A copy of all claims on appeal is attached hereto as Appendix A.

Docket No.: 42390P18575
Application No.: 10/762,037

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Claim 1 refers to a method with the following elements:

dynamically modifying one or more attributes of each of a plurality of requests to access one or more memory devices, wherein dynamically modifying the one or more attributes comprises dynamically prioritizing the plurality of requests in response to latency sensitivity of each of the plurality of requests (FIG. 1, item 120 and [0023]-[0024]); and

arbitrating among the plurality of requests to select a request to send to the one or more memory devices in a time slot based on the one or more attributes (FIG. 1, item 130 and [0025]).

Independent claim 1 is directed to a novel mechanism for prioritizing requests with different latency sensitivity levels and managing the requests in response to their latency sensitivity. Thus, requests with a high level of latency sensitivity may be sent to the memory devices in a more timely fashion.

VI. GROUND OF REJECTION

- A. Are claims 1 and 3 anticipated by U.S. Patent Application 2003/0177296 (*Kurth*) under 35 U.S.C. §102(e)?
- B. Are claims 4 and 8 obvious in view of *Kurth* and U.S. Patent Application 2003/021070 (*Odman*) under 35 U.S.C. §103(a)?
- C. Are claims 5 and 6 obvious in view of *Kurth* and Applicant's Admitted Prior Art (AAPA) under 35 U.S.C. §103(a)?
- D. Is claim 7 obvious in view of *Kurth* and U.S. Patent Application 2002/0116555 (*Somers*) under 35 U.S.C. §103(a)?

Docket No.: 42390P18575
Application No.: 10/762,037

VII. ARGUMENT

A. Introduction

While the arguments below are directed only to Claim 1, they are believed to apply also to the other pending claims.

B. Absent any Teaching of dynamically modifying one or more attributes of each of a plurality of requests, the cited reference cannot anticipate “dynamically modifying one or more attributes of each of a plurality of requests to access one or more memory devices, wherein dynamically modifying the one or more attributes comprises dynamically prioritizing the plurality of requests in response to latency sensitivity of each of the plurality of requests” as Recited in Claim 1.

The Examiner has rejected claims 1, 3, and 13 under 35 U.S.C. §102 (e) as being anticipated by U.S. Patent Application No. 2003/0177296 (*Kurth*). Claim 13 has been cancelled and, thus, the rejection of claim 13 is moot.

Regarding the claim terms directed to “dynamically modifying one or more attributes of each of a plurality of requests ... wherein dynamically modifying the one or more attributes comprises dynamically prioritizing the plurality of requests in response to latency sensitivity of each of the plurality of requests,” the Office action directs the Appellant’s attention to FIG. 4 of *Kurth*. In particular, the Office action directs the Appellant’s attention to process block 400 of *Kurth*. The Appellant respectfully notes, however, that FIG. 4 of *Kurth* is directed to a process that includes selecting “a priority level from [a] configuration register” (see, e.g., [0021], lines 3-4) and “[a]fter selecting the priority level, the agent makes 402 the priority request to the arbiter” (see, e.g., [0021], lines 6-8). Thus, the passage relied upon by the Office action does not teach “dynamically modifying one or more attributes of each of a plurality of requests to access one or more memory devices, wherein dynamically modifying the one or more attributes

comprises dynamically prioritizing the plurality of requests in response to latency sensitivity of each of the plurality of requests.” Instead, it merely teaches selecting a priority level from a configuration register and sending a priority request to an arbiter that indicates the selected priority level.

Accordingly Claim 1 is believed to be allowable over *Kurth*. The remaining claims are believed to be allowable also on similar grounds and for the particular recitations set forth expressly in each claim, respectively.

Claims 4, 8, 10, and 14-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Kurth* in view of Patent Application No. 20030210710 (*Odman*). Claims 8, 10, and 14-20 have been cancelled and, thus, the rejection of claims 8, 10, and 14-20 is moot. For at least the reasons sets forth below, the Appellant submits that claim 4 is not rendered obvious by *Kurth* in view of *Odman*.

Odman is cited as teaching “combining multiple requests ... into a larger request ... to fill a given time slot.” Whether or not *Odman* discloses the limitations cited by the Office action, it does not teach or suggest “dynamically modifying one or more attributes of each of a plurality of requests ... wherein dynamically modifying the one or more attributes comprises dynamically prioritizing the plurality of requests in response to latency sensitivity of each of the plurality of requests,” as recited in claim 1. Because neither *Kurth* nor *Odman* teach or suggest the above-cited claim limitations, no combination of *Kurth* and *Odman* teaches or suggests the invention as claimed in claim 1. For at least the reason that dependent claims include the limitations of the claims from which they depend, the Appellant respectfully submits that dependent claim 4 is not rendered obvious by *Kurth* in view of *Odman*.

Docket No.: 42390P18575
Application No.: 10/762,037

Dependent claims 5, 6, 11 and 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Kurth* in view of Appellant's Admitted Prior Art (*AAPA*). Claims 5 and 6 depend from claim 1. Claims 11 and 12 have been cancelled and, thus, the rejection of claims 11 and 12 is moot. For at least the reasons sets forth below, the Appellant submits that claims 5, 6, 11, and 12 are not rendered obvious by *Kurth* in view of *AAPA*.

AAPA is cited as teaching "request types." Whether or not *AAPA* discloses the limitations cited by the Office action, it does not teach or suggest "dynamically modifying one or more attributes of each of a plurality of requests ... wherein dynamically modifying the one or more attributes comprises dynamically prioritizing the plurality of requests in response to latency sensitivity of each of the plurality of requests," as recited in claim 1. Because neither *Kurth* nor *AAPA* teach or suggest the above-cited claim limitations, no combination of *Kurth* and *AAPA* teaches or suggests the invention as claimed in claim 1. For at least the reason that dependent claims include the limitations of the claims from which they depend, the Appellant respectfully submits that dependent claims 5 and 6 are not rendered obvious by *Kurth* in view of *AAPA*.

Dependent claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over *Kurth* in view of U.S. Patent Application 2002/0116555 (*Somers*). Claim 7 depends from claim 1. For at least the reasons sets forth below, the Appellant submits that claim 7 is not rendered obvious by *Kurth* in view of *Somers*.

Somers is cited as teaching "plurality of DMA controllers." Whether or not *Somers* discloses the limitations cited by the Office action, it does not teach or suggest "dynamically modifying one or more attributes of each of a plurality of requests ... wherein dynamically modifying the one or more attributes comprises dynamically

prioritizing the plurality of requests in response to latency sensitivity of each of the plurality of requests,” as recited in claim 1. Because neither *Kurth* nor *Somers* teach or suggest the above-cited claim limitations, no combination of *Kurth* and *Somers* teaches or suggests the invention as claimed in claim 1. For at least the reason that dependent claims include the limitations of the claims from which they depend, the Appellant respectfully submits that dependent claim 7 is not rendered obvious by *Kurth* in view of *Somers*.

VIII. CONCLUSION

Appellants respectfully submit that all the appealed claims in this application are patentable and request that the Board of Patent Appeals and Interferences overrule the Examiner and direct allowance of the rejected claims.

Respectfully submitted,

Date: May 14, 2008

/Philip A. Pedigo/Reg. NO. 52,107/

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Docket No.: 42390P18575

Application No.: 10/762,037

8

APPENDIX OF CLAIMS (37 C.F.R. § 1.192(c)(7))

1. (Previously Presented) A method comprising:

dynamically modifying one or more attributes of each of a plurality of requests to access one or more memory devices, wherein dynamically modifying the one or more attributes comprises dynamically prioritizing the plurality of requests in response to latency sensitivity of each of the plurality of requests; and

arbitrating among the plurality of requests to select a request to send to the one or more memory devices in a time slot based on the one or more attributes.
2. (Cancelled) The method of claim 1, wherein dynamically modifying the one or more attributes comprises dynamically prioritizing the plurality of requests in response to latency sensitivity of each of the plurality of requests.
3. (Original) The method of claim 2, wherein the latency sensitivity of each of the plurality of requests changes in response to space available in a buffer storing the corresponding request.
4. (Original) The method of claim 1, further comprising dynamically changing a length of each of the plurality of requests in response to a size of the time slot.
5. (Original) The method of claim 1, wherein the plurality of requests comprises one or more data read requests, one or more data write requests, and one or more buffer descriptor read requests.

6. (Original) The method of claim 1, further comprising sending the selected request to the memory devices via a digital multimedia interconnect.

7. (Original) The method of claim 1, further comprising asserting the plurality of requests using a plurality of direct memory access (DMA) controllers in response to an instruction from a processor.

Claims 8-20 (Cancelled)

21. (Withdrawn) A system comprising:

a plurality of dynamic random access memory (DRAM) devices;

one or more audio coder-decoders; and

an input/output controller, coupled between the DRAM devices and the one or more audio coder-decoders, the input/output controller having an audio controller, the audio controller comprising

a plurality of memory access controllers to assert a plurality of requests to access one or more of the DRAM devices, wherein one or more attributes of the plurality of requests are dynamically changeable; and

a first arbiter to arbitrate among the plurality of requests to select a request based on the one or more attributes of the plurality of requests.

22. (Withdrawn) The system of claim 21, wherein each of the plurality of memory access controllers further comprises a buffer to temporarily store one or more requests, a priority state machine to dynamically prioritize the one or more requests, and request length determination circuitry to determine length of the one or more requests.
23. (Withdrawn) The system of claim 22, wherein the request length determination circuitry comprises:
a plurality of multiplexers; and
one or more flip-flops coupled to the plurality of multiplexers.
24. (Withdrawn) The system of claim 21, wherein the first arbiter comprises a first plurality of arbiters and a second arbiter, outputs of the first plurality of arbiters are coupled to inputs of the second arbiter.
25. (Withdrawn) The system of claim 24, wherein the first plurality of arbiters comprise a plurality of First Come First Serve (FCFS) arbiters.
26. (Withdrawn) The system of claim 24, wherein the second arbiter comprises a fixed priority arbiter.

27. (Withdrawn) The system of claim 22, wherein the priority state machine prioritizes the plurality of requests based on space available in the buffer of each of the plurality of memory access controllers.

28. (Withdrawn) The system of claim 21, further comprising:
a memory controller coupled to the DRAM devices; and
a digital multimedia interconnect, coupled between the memory controller and the input/output controller, wherein the selected request is sent to one or more of the DRAM devices via the digital multimedia interconnect and the memory controller.

29. (Withdrawn) The system of claim 28, further comprising a central processing unit, coupled to the memory controller, to send an instruction to the input/output controller to cause the plurality of memory access controllers to assert the plurality of requests.

XI. EVIDENCE APPENDIX

None.

XII. RELATED PROCEEDINGS APPENDIX

None.